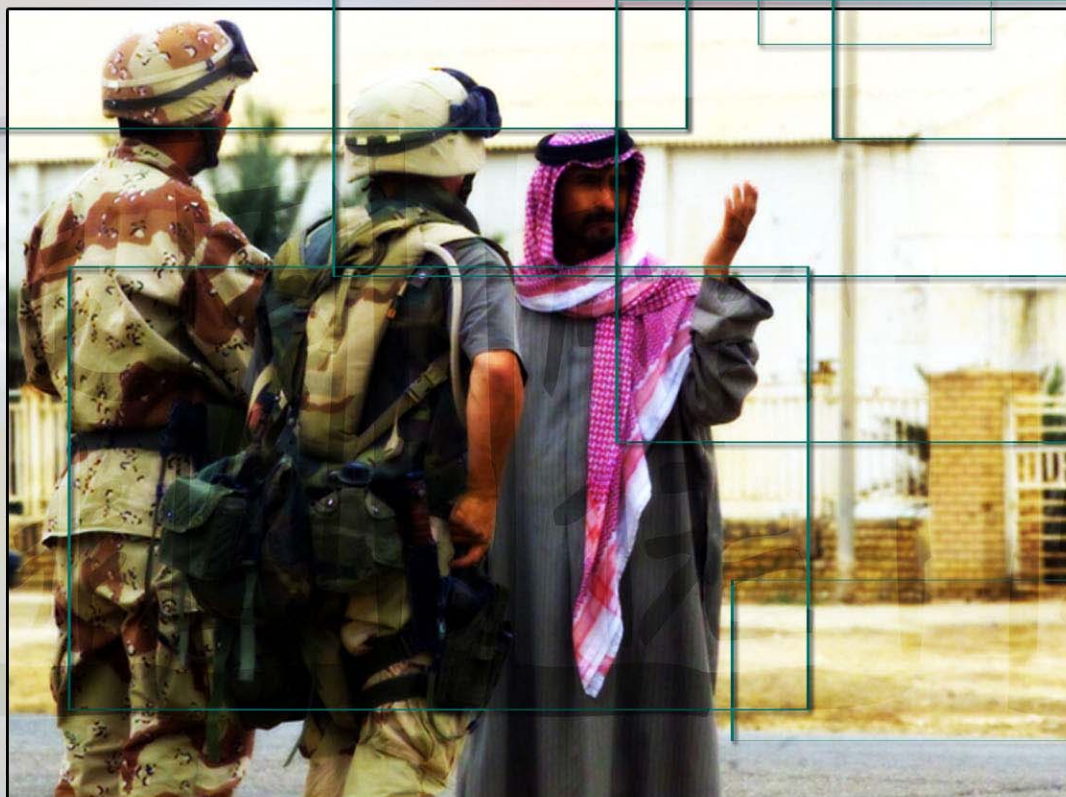
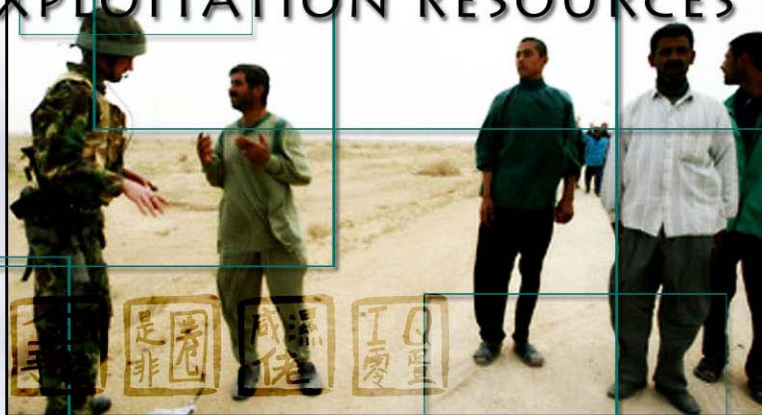


LASER

LANGUAGE AND SPEECH
EXPLOITATION RESOURCES

ADVANCED CONCEPT
TECHNOLOGY
DEMONSTRATION



INTEGRATED
ASSESSMENT
PLAN
MARCH 2004

LASER

Advanced Concept Technology Demonstration

Integrated Assessment Plan

March 2004

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LASER ACTD IAP

March 2004

Overview

1



The Language and Speech Exploitation Resources Advanced Concept Technology Demonstration, which concludes in 2006, will develop and assess the military utility of speech-to-speech and text-to-text foreign language translation technologies for warfighter missions.

Mission

13



Detachment 1 Air Force Operational Test and Evaluation Center will conduct utility assessments for the United States Army Intelligence and Security Command and Marine Forces Pacific.

Methodology

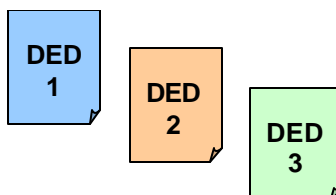
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The assessment team identified three critical operational issues and twelve objectives to assess the military utility of foreign language translation technologies. Collected information will consist of objective and subjective data designed to assess translation effectiveness, suitability, and mission impact.

Field Execution and Planning

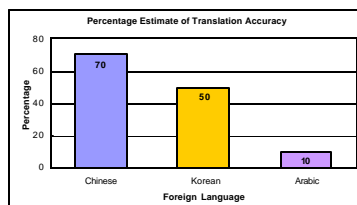
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The assessment team will develop demonstration execution documents prior to each of the Language and Speech Exploitation Resources events to provide detailed field execution plans.

Logistics

31



The assessment team will coordinate logistics support for each assessment event. This support will include coordination of transportation and lodging for assessment team members as well as shipment of equipment required to conduct each assessment.

Command of the Assessment Team

33



Government and civilian contractor personnel from Detachment 1 Air Force Operational Test and Evaluation Center will support each event. The assessment team will consist of a government test director, a lead analyst, and one or more data collectors.

Annexes

- A—Acronyms
- B—Preliminary Universal Joint Task List
- C—Data Trace
- D—Program Protection

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Overview

Purpose

This integrated assessment plan (IAP) provides the Detachment 1 (Det 1) Air Force Operational Test and Evaluation Center (AFOTEC) assessment approach for the Language and Speech Exploitation Resources (LASER) Advanced Concept Technology Demonstration (ACTD). The ACTD has a 5-year time frame of integration and demonstration, from fiscal year (FY) 2002 to FY 2006. The co-operational managers (OM) for the LASER ACTD include Marine Forces Pacific (MARFORPAC) and United States Army Intelligence and Security Command (USAINSCOM).

The LASER ACTD is being undertaken in response to shortfalls of qualified linguists identified by United States Pacific Command (USPACOM), USAINSCOM, and their components. These shortfalls impact the capability to conduct worldwide operations in widely diverse language environments. LASER ACTD technologies are intended to enhance operational and intelligence personnel abilities while executing missions that require a wide range of linguistic resources and aid commanders in coordinating operations in multinational and coalition environments.

The LASER ACTD is leveraging previous work accomplished during the Human Intelligence and Counterintelligence Support Tools (HICIST) ACTD, conducted from FY 99 to FY 03. During the HICIST ACTD, Det 1 AFOTEC assessed the military utility of 32 technologies designed to improve human intelligence and counterintelligence missions. The 32 technologies included five different devices for translating foreign language documents and verbal communications.

This IAP represents the overall approach for assessing candidate speech-to-speech and text-to-text foreign language translation technologies for the LASER ACTD. Det 1 AFOTEC will develop a detailed demonstration execution document (DED) prior to each event to provide more in-depth information regarding event-specific assessment goals and procedures.

Background

Operational units typically deploy with insufficient numbers of qualified foreign language specialists and limited reach-back support. Joint forces are increasingly becoming coalition forces. Multiple language requirements exist across all disciplines in the full range of military operations: medical assistance, noncombatant evacuation operation, force protection, humanitarian and peacekeeping operations, hostile action, and intelligence gathering and exploitation. Department of Defense (DoD) forces deploy to worldwide geographic locations with widely diverse languages and must operate with multinational forces and coordinate military operations with government agencies and international organizations. Often these deployments occur with inadequate means to communicate in the languages of the multinational forces and organizations. Emerging automated translingual communicator and translator technologies may be of great value in reducing the language barrier, but they must have demonstrated military utility and a doctrinal basis for employment.

Foreign language translation capabilities have applicability for numerous items on the Universal Joint Task List (UJTL). Det 1 AFOTEC selected a candidate list of UJTL requirements relevant to the LASER ACTD. Annex B illustrates the relationship between the LASER capabilities, derived from the LASER management plan, and UJTL requirements. Throughout the ACTD, Det 1 AFOTEC will relate the assessment results to the UJTL requirements by grouping speech-to-speech and text-to-text capabilities into three mission areas: coalition coordination activities, military operations, and civil/humanitarian operations.

ACTD Program

The ACTD program, initiated in 1994, emphasizes the assessment and integration of commercial or government technologies (as opposed to technology development) to expedite the transition of maturing technologies from the developers to the users.

ACTDs demonstrate the use of such technologies to address critical military needs and are established based on response to user needs, maturity of technologies, and potential effectiveness of the technologies. At the conclusion of an ACTD, there are three potential outcomes. The user sponsor may recommend one of the following:

- Acquisition and fielding of the technology
- Further development or modification of the technology
- Terminating pursuit of the technology

Many ACTDs are based on advanced technologies that may permit, or even demand, new operating procedures, tactics, and doctrine in order to realize their maximum

potential. An ACTD provides a means to develop, refine, and optimize these warfighting concepts to achieve maximum utility and effectiveness. ACTDs may include a combination of informal events such as demonstrations and limited user evaluations (LUE) as well as formal assessments such as limited military utility assessments (LMUA) and military utility assessments (MUA). For the LASER ACTD, the Marine Experimentation Center (MEC) will take the lead in conducting the demonstrations and LUEs, with support from Det 1 AFOTEC as required. Det 1 AFOTEC will conduct the LMUAs and MUAs, with assistance from the MEC as required.

ACTDs

- Provide a mechanism for timely conversion of a technology-based opportunity to warfighter/user capability
- Assemble technologies and integrate them into an operationally usable form
- Insert new technologies or concepts into operational environment to demonstrate new or improved military capability and utility
- Allow an assessment based on demonstrating “value added” contribution
- Focus on warfighter’s understanding

Demonstration

A demonstration is an informal event used to familiarize the users with candidate technologies. The military users provide human factors feedback and their initial reactions to the technologies, while identifying any additional capabilities they would like to see. This event can be conducted with little planning, training, or operational conditions. Collected data are used to support technology development prior to a formal LMUA or MUA.

Limited User Evaluation

An LUE is an informal event in which technologies are inserted into a training exercise or unit training and possibly used to complete a mission task. During this event, the assessment team observes all activities and collects data for mission fit, technical maturity, and operational use. Minimal planning is required for the assessment, and users generally receive limited training on the equipment. Upon completion of the event, military users complete questionnaires to provide human factors feedback and initial reactions and to identify any additional desired capabilities. Collected data primarily consist of preliminary subjective data to support technology development prior to a formal assessment.

Limited Military Utility Assessment

An LMUA is a formal assessment in which technologies are inserted into a training exercise, users are trained with the technology, and they have incorporated the technology into their concept of operations (CONOPS). The CONOPS formalizes the tactics, techniques, and procedures (TTP) and the number and type of personnel required to complete the task with the technology. The assessment may be conducted as a planned subset of an MUA or as an MUA with known limitations (e.g., scenarios are not completely developed, scope is limited, or the environment is not fully operational). The assessment team coordinates specific events within the exercise or training to collect objective and subjective data to support military utility analysis.

Military Utility Assessments

An MUA is a comprehensive, formal assessment of a technology that requires considerable planning and prior coordination. Instead of testing to requirements as in an operational or developmental test, an MUA identifies “value added” as the overarching assessment metric to determine if the capability (technology and/or procedures) warrants further development or acquisition. Value added relies on a thorough understanding of current baseline capabilities and the ability to quantify improvements (or decrements) in operational parameters. Value added also depends largely on the warfighter’s opinion and judgment regarding the utility of the technology or procedure to complete the mission.

Military utility is a measure of a mission’s success or improvement in an operational environment, rather than an achievement of technical performance objectives.

In attempting to identify value added, an MUA must cope successfully with two major challenges:

- Incorporation of the technology into realistic operational scenarios with real users and a realistic range of conditions.
- Collection of data to measure the impact of the technology on warfighter missions and operations.

The assessment team must work closely with exercise or event planners to develop scripted scenarios that emulate realistic military environments and provide the user with an opportunity to evaluate utility and gain experience with the capabilities. The objectives of the MUA are to conduct meaningful assessments of the capability,

develop and test CONOPS to optimize military effectiveness, and prepare to transition the capability into acquisition without loss of momentum, if warranted.

Technology Selection and Technical Assessment Process

The LASER integrated product teams (IPT) are responsible for identifying and recommending technologies to the OMs for inclusion in the ACTD. One IPT handles speech-to-speech technologies, and a separate IPT manages text-to-text technologies. The IPTs are comprised of experts drawn from DoD, Joint Services, and national/service laboratories. They are responsible for surveying each IPT category for technologies in both domestic and international markets as well as government science and developmental efforts. For each candidate LASER tool, IPT members complete worksheets detailing technology characteristics and technical readiness levels. Technology characteristics such as portability, integration, maturity, domain, and potential effectiveness are included to assist in selecting the most promising venue for operational assessment. Throughout the LASER ACTD, the IPTs will complete the worksheets and provide them to the technical managers (TM) and OMs. These IPTs will also conduct workshops to identify the specific technologies under development and provide insight into methods to assess them. In addition, they will conduct technical assessments to ensure that the LASER technologies are “mature” (i.e., available and ready to participate in warfighter exercises).

Based on the technology worksheets, the TMs and OMs will identify which technologies should proceed to technical testing. Another downselect may occur after this testing is complete and the technical IPTs assess the results. The list of technologies selected for technical testing is open for new candidates that show maturity over the course of the ACTD. If new technologies become available, they may be assessed, especially if they address a critical or high-need area.

Technology Descriptions

Candidate speech-to-speech and text-to-text technologies for the LASER ACTD can be categorized according to three different dimensions—language direction, input, and dialogue.

Language Direction

- *One-way translation* is translation from a source language into a target language.
- *Two-way translation* is translation from a source language into a target language and from a target language back into the source language.

Input

- *Phrase-based translation* relies on speech recognition software to identify specific speech input in the source language and match it to a pre-recorded phrase in a target language. The input can be the phrase itself (e.g., “Put your hands in the air”) or a simple command that stands for the phrase (e.g., the warfighter programs the device to recognize the command “Warning 1” as “Put your hands in the air”).

- *Free-flowing translation* uses computer processing to translate words or sets of words from a source language input into a language with equivalent meaning.

Dialogue

- *Domain-specific dialogue* restricts the language input to specific topics (e.g., medical or force protection). Domains can be added with extra modules or dictionaries.
- *Natural dialogue* does not restrict language dialogue to specific topics.

Speech-To-Speech Technologies

Speech-to-speech technologies are designed to recognize speech patterns and translate them into the appropriate target language to convey the same meaning as the input. Although not an all-inclusive list of LASER technologies, potential speech-to-speech technologies for the LASER ACTD are listed in Table 1 and categorized according to the three dimensions just described. Each technology is further described in the paragraphs that follow.

Table 1. Speech-to-Speech Technologies: Candidate speech-to-speech technologies for the LASER ACTD can be categorized according to language direction, input, and dialogue.

Speech-to-Speech Technology	Language Direction	Input	Dialogue
Virtual Response Translator (VRT)	One-way	Phrase-based	Natural
Speechalator	One-way	Phrase-based	Domain-specific
Phraselator	One-way	Phrase-based	Domain-specific
Compact Aids for Speech Translation (CAST) (Babylon) Personal Digital Assistant (PDA)	One-way	Phrase-based	Domain-specific
Speaking Multilingual Interactive Natural Dialogue System (SMINDS)	Two-way	Free-flowing	Domain-specific

VRT

The VRT is a portable device, approximately the size of a PDA, that emits pre-recorded spoken phrases in response to a warfighter's verbal command (see Figure 1). The foreign language phrases are intended to foster understanding, produce physical compliance, or elicit gestures and body language in the form of head nods and hand motions from persons with whom the warfighter is interacting. The VRT is "speaker dependent"—an individual user must set up the VRT to recognize his/her voice. The VRT can be programmed to recognize multiple voices; however, each user must set up the device to recognize his/her own voice. The VRT has a built-in speaker and can be attached to external speakers.

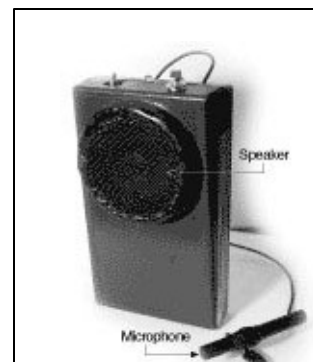


Figure 1. VRT: In response to English verbal commands, the VRT emits pre-recorded foreign language phrases.



Figure 2. Speechalator:
The Speechalator operates on a typical PDA platform.



Figure 3. Phraselator:
The Phraselator is a speaker-independent, phrase-based platform.



Figure 4. CAST (Babylon) PDA: The CAST (Babylon) PDA operates on practically any PDA-type platform.

Speechalator

Speechalator runs on a standard pocket personal computer device (see Figure 2). A push-to-talk button is used to key the unit's microphone, and the speaker talks in his/her language. The recognized utterance is first displayed on the screen, with the translation following, and the utterance is then spoken in the target language. Buttons are provided for replaying the output and for switching the input to the target language. A text scroll menu interface allows the warfighter to visually select the appropriate phrases, using a stylus. The Speechalator is "speaker independent"—an individual user is not required to set up the device to recognize his/her voice. However, the speaker may have to adapt verbal input so the Speechalator can recognize the user.

Phraselator

Phraselator is a ruggedized PDA operating on a Windows Compact Edition 4.2 software system (see Figure 3). The Phraselator can retain approximately 1,000 phrases and is speaker independent. The phrases are played through a built-in speaker. The Phraselator also uses a stylus to manually scroll phrases and a push-button option to audibly play the text phrase. The phrases are grouped by mission domains and are loaded into the Phraselator via external modules.

CAST (Babylon) PDA

The CAST (Babylon) PDA is one-way speech-to-speech software that can be loaded on nearly any PDA platform (see Figure 4). CAST (Babylon) software can be loaded onto a PDA that is lighter and cheaper than the Phraselator and is also speaker independent. The software has similar functions for verbal input/output and has a scroll screen and stylus interface to manually find foreign language phrases. The PDA used with the CAST (Babylon) has less processing power, less language flexibility/capacity, and a shorter battery life than the Phraselator.

SMINDS

The SMINDS is two-way speech-to-speech translation software loaded on a laptop computer (see Figure 5). The SMINDS is speaker independent and is designed to aid in the process of conducting interviews in a target language. When a warfighter speaks a question into the SMINDS, the system recognizes what was said and displays the text on the system's screen as verification. The system also displays the translation and plays it aloud to the interviewee. The interviewee can then reply, and a speech-to-speech translation from the target language is played in English to the warfighter.

Text-To-Text Technologies

These technologies consist of personal computer or laptop platforms to perform translations of textual material. Exploitation platforms translate paper documents or digital photos using optical character recognition (OCR) and machine translation (MT) software. The OCR process identifies text characters and converts them into electronic characters for MT. The MT software recognizes the electronic word patterns and translates them into the appropriate language conveying the same meaning. However, OCR and MT are separate functions and can operate independently of each other. If the input is already in electronic format, then the device does not require a separate OCR scanning process to convert characters into electronic form. Text-to-text MT can be used in a variety of scenarios that apply to coordination between United States forces and foreign nationals of partner nations (rough translation for legal, personnel, and planning functions, and briefing slide conversion). Text-to-text MT can also be used to identify and prioritize documents of possible intelligence value for human translators.

Although not an all-inclusive list, candidate text-to-text technologies for the LASER ACTD are identified in Table 2 and categorized according to the three dimensions of language direction, input, and dialogue. The technologies are described further in the paragraphs that follow.

Table 2. Text-to-Text Technologies: Candidate text-to-text technologies for the LASER ACTD can be categorized according to language direction, input, and dialogue.

Text-to-Text Technology	Language Direction	Input	Dialogue
Forward Area Language Converter (FALCon)	One-way	Free-flowing	Natural
Document and Multimedia Exploitation (DOMEX) Tactical Support Suite (TSS)	One-way	Free-flowing	Natural
Translingual Instant Messenger (TrIM)	Two-way	Free-flowing	Natural

FALCon

The FALCon was developed by the Army Research Laboratory and is designed to translate foreign documents into English (see Figure 6). This package includes a Windows 2000 operating system, paper scanner, digital camera, laptop computer, and multiple communication links enclosed in a specialized case. Captured foreign documents are scanned into the laptop computer via the paper scanner or downloaded electronically from the digital camera. The scanned or digital image is passed through the OCR software, which groups the pixels into characters and converts the characters into words. The software compares the words to the built-in dictionary and highlights all the possible errors. Then the document is passed through MT software. The first pass through the MT software checks the dictionary for the general language. The second

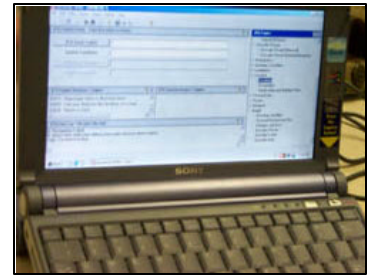


Figure 5. SMINDS: The SMINDS is a laptop computer that provides two-way speech-to-speech communication.



Figure 6. FALCon: The FALCon allows warfighters to scan foreign language documents in deployed environments to help them identify basic content and prioritize documents.

pass checks the dictionary for words relating to specific military lexicons to assist warfighters in identifying whether the document contains useful intelligence. Additionally, the FALCon has keyword search and the capability to translate foreign text in PowerPoint presentations. The FALCon is intended to provide warfighters the ability to understand the general idea of a foreign document and assist in identifying documents that have potential intelligence value.

DOMEX TSS

The DOMEX TSS is an integrated suite of hardware and software tools to accomplish batch scanning, OCR, MT, and full-text indexing. The DOMEX TSS scanning, OCR, and MT functions are similar to the FALCon. The DOMEX TSS full-text indexing for search and retrieval of relevant documents permits both keyword and thematic searches. The DOMEX TSS is intended to be used on a Web-based secure intelligence DoD

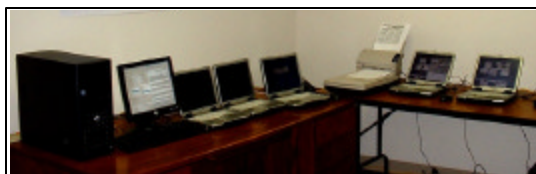


Figure 7. DOMEX TSS: The DOMEX TSS provides scanning, OCR, MT, and tracking of foreign language documents.

network, using tactical or satellite communications reach-back (see Figure 7). The system can also be used in a deployed, stand-alone environment. The DOMEX TSS consists of a series of 8 to 10 laptops, a server, and a redundant array of independent disks storage system to manage large volumes of foreign documents.

TrIM

The TrIM was developed to assist communication for command and coordination in coalition networks (see Figure 8). The TrIM operates on a client-server relationship and uses the Simple Instant Messaging and Presence instant messaging protocol architecture to distribute language translation services. Multiple parties, using different language translation servers, can converse at the same time. All parties to a conversation see both original messages and their translations.

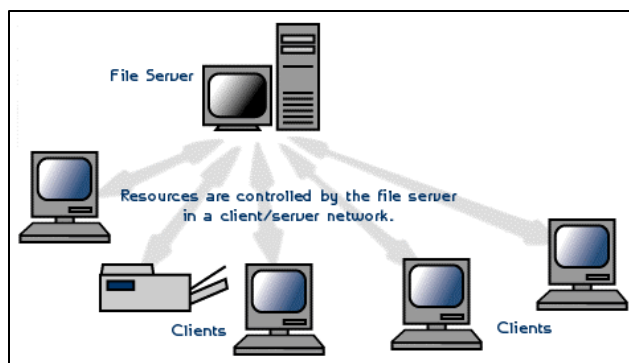


Figure 8. TrIM: The TrIM operates on a client-server relationship and provides instant messaging text translation.

MUA Objectives

To assess the military utility of candidate speech-to-speech and text-to-text LASER technologies, the Det 1 AFOTEC assessment team developed three critical operational issues (COI). To formulate these COIs, the assessment team combined the warfighters' requirements with ACTD objectives and information gathered during focus meetings with users, operation and experimentation IPT meetings, and technology demonstrations.

- COI 1: Do LASER technologies effectively support warfighter translation requirements?
- COI 2: Are LASER technologies suitable in the warfighting environment?
- COI 3: What impact do LASER technologies have on the warfighter mission?

Assessment Venues

The information used to determine the military utility of LASER ACTD technologies will come from demonstrations, LUEs, LMUAs, and MUAs. Det 1 AFOTEC will collect varying levels of warfighter data at all venues. Appropriate assessment events will be identified by matching mature, developed technologies with assessment venues that offer scenarios and users suited to employ those technologies. Specifically, the OMs will provide the TMs with a list of available assessment events to match technologies and warfighter missions. Potential assessment venues include unit training events, deployment work-ups, small-scale exercises, and large-scale command post exercises and field training exercises within the USPACOM area of responsibility. Depending on the venue, several different candidate technologies with similar capabilities may be inserted simultaneously to permit comparison and help the assessment team identify which technology provides added value and the best fit to the warfighters' mission.

Scope and Limitations

Det 1 AFOTEC's assessment of the technologies included in the LASER ACTD may be limited by the factors identified in Table 3. The assessment team has developed a strategy to mitigate the impact of each potential limitation.

Table 3. Limitations, Impacts, and Mitigation Strategies: Det 1 AFOTEC developed several strategies to mitigate the impact of potential limitations and constraints.

Limitation	Impact	Mitigation Strategy
Warfighter availability	Warfighters available to participate in each event may not be the intended users of LASER technologies.	Conduct early planning and coordination.
Assessment duration	Short duration of assessment events prevents rigorous maintainability and reliability assessments.	Collect and report data characterizing technology failures and maintenance actions observed during the short duration of each event.
Immature technologies	Inclusion of immature technologies may lead to false conclusions of no utility.	Use technology worksheets to identify technical readiness for operational assessment.
Insufficient foreign language documents	Inability to stress text-to-text platforms.	Locate repositories of foreign language documents with translations (e.g., Harmony program office).
Communication links	Some LASER technologies may require network or bandwidth modifications.	Conduct early planning and coordination.
No accepted objective standards to measure translation accuracy	Inability to objectively measure MT accuracy.	Use subjective rating scales and questionnaires that ask experienced linguists to estimate translation accuracy.
Lack of baseline productivity data	Hard estimates of the impact of each technology on productivity may not be possible.	Develop and use questionnaires to garner subjective productivity data.

Participants



USAINSCOM

USAINSCOM is a major Army command that conducts intelligence, security, and information operations for military commanders and national decision makers. Charged with providing the warfighter the seamless intelligence needed to understand the battlefield and to focus and leverage combat power, USAINSCOM collects intelligence information in all intelligence disciplines. USAINSCOM also conducts a wide variety of activities, ranging from intelligence preparation of the battlefield to situation development, signal intelligence analysis, imagery exploitation, and science and technology intelligence production. USAINSCOM provides the co-OM providing concept development, coordinating assessment venues, and training operational units for the LASER ACTD.

MARFORPAC



MARFORPAC is one of two combatant command-level Service component commands for the Marine Corps. MARFORPAC commands all Marine bases and stations on the West Coast and throughout the Pacific. It is headquartered at Camp Smith, Hawaii, and is the largest field command in the United States Marine Corps. MARFORPAC is a co-OM providing concept development, coordinating assessment venues, and assisting in the identification of operational users to assess ACTD technologies. The MEC component of MARFORPAC provides the designated OM representative.

Battle Command Battle Laboratory



Battle Command Battle Laboratory (BCBL) has elements at three locations: Fort Leavenworth, KS; Fort Gordon, GA; and Fort Huachuca, AZ. Together, the three elements are responsible for integrating all United States Army Training and Doctrine Command activity related to the art and science of battle command and information warfare. BCBL, Fort Huachuca (BCBL[H]) researches issues concerning intelligence collection, dissemination, and electronic warfare and has direct interest in the LASER ACTD and its outcomes. For this reason, BCBL(H) was designated the co-TM for this ACTD and provides direction to the IPT chairs and management oversight.

Director of Central Intelligence Foreign Language Committee



Director of Central Intelligence (DCI) Foreign Language Committee (FLC) provides the other co-TM. DCI FLC is the focal point for all foreign language-related issues within the intelligence community. The committee standardizes all foreign language testing, develops and coordinates plans for a unified foreign language training system, explores ways to open the system to other federal agencies, creates partnerships with the private sector, and markets government-developed language training materials for secondary commercial use. The committee also explores ways to leverage the use of technology for improved training and operational use.

USPACOM

USPACOM is headquartered at Camp Smith, HI. USPACOM's mission is to enhance security and peaceful development in the Asia-Pacific region. USPACOM's area of responsibility includes 43 countries and nearly 60 percent of the world's population. USPACOM is the sponsor for this ACTD.



United States Joint Forces Command

United States Joint Forces Command (USJFCOM) is headquartered in Norfolk, VA, and is one of nine unified commands in the DoD. The DoD appointed USJFCOM as the "transformation laboratory." Its duties include transformation, experimentation, Joint training, interoperability, and force provision. USJFCOM is the designated transition manager to coordinate transition planning and execution of LASER ACTD products. The transition manager is responsible for program transition and residual sustainment planning and supervision. Since the LASER ACTD has a variety of technologies and users, the exact platforms for transition will be identified as the program progresses.



Det 1 AFOTEC

Det 1 AFOTEC provides rapid and cost-efficient determination of operational military utility of systems to meet warfighters' needs in support of Air Force, Joint, DoD, and other government agencies. Det 1 AFOTEC will provide assessment support to the LASER OMs by conducting utility assessments to determine operational effectiveness, suitability, and mission impact to the warfighter. Det 1 AFOTEC is responsible for developing the detailed test plans and operational measures for assessing LASER technologies prior to each event as well as post-event MUA reports.



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Mission

Det 1 AFOTEC's mission during the LASER ACTD is to complete operationally realistic utility assessments of speech-to-speech and text-to-text foreign language translation technologies. The team will collect both objective and subjective data to identify translation effectiveness, suitability, and mission impact of each technology in the warfighting environment.



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Methodology

Schedule

The assessment schedule will be determined by matching mature, developed technologies with assessment venues that offer scenarios and users suited to employ those technologies. As stated earlier, assessment venues may include unit training events, deployment work-ups, small-scale exercises, and large-scale command post exercises and field training exercises within the USPACOM area of responsibility.

Locations

The final locations for assessments are still under consideration. Location-specific information will be described in the DEDs that Det 1 AFOTEC will produce prior to each LMUA or MUA event.

General Assessment Approach

Det 1 AFOTEC's data collection and assessment activities focus on providing relevant information to identify whether the participant technologies demonstrate potential military utility to effectively support the warfighter's translation needs. Toward that end, Det 1 AFOTEC will assess the operational effectiveness, suitability, and mission impact of each device.

- Operational effectiveness is the overall degree of mission accomplishment of a system when used by representative personnel in the planned or expected environment. Operational employment of the system includes representative organization, doctrine, and threat.
- Suitability is the degree that a system can be placed satisfactorily in field use, with consideration given to maintenance requirements, training, usability, deployability, and compatibility/interoperability.
- Mission impact is the degree to which a system impacts TTPs, CONOPS, productivity, and personnel requirements.

To address these goals, Det 1 AFOTEC will collect both objective and subjective data in the context of realistic scenarios. Objective data will consist primarily of manual and electronic logs designed to assess translation timeliness, failures, and maintenance actions. Because an MUA is designed to address the military utility of candidate technologies for the warfighter, much of the data collected throughout the ACTD will be subjective in nature. Subjective data will consist of rating scales, questionnaires, interviews, after-action reviews, and observation logs to assess translation effectiveness, suitability, and mission impact. Much of the suitability data will involve subjective judgments, both from operational communities and subject matter experts. Interviews and questionnaires will be used to explain or expand on the operations performed during the assessment events. Participants will help recommend improvements and identify deficiencies.

Approach to the Objectives

To identify the critical elements needed to address each LASER COI, Det 1 AFOTEC subdivided the COIs into objectives (see Table 4). Because the IAP describes the assessment approach for all technologies that may potentially be assessed during the ACTD, the breakdown stops at the objective level. In the DEDs produced prior to each LMUA or MUA event, Det 1 AFOTEC will further divide the objectives into subobjectives and measures specific to the technologies that will be included in the event. Each subobjective will further categorize the objectives according to speech-to-speech and text-to-text technologies, and the measures will specify the precise data elements to be collected for each technology. After each assessment event, Det 1 AFOTEC will be able to link collected data back to the core set of common objectives presented in Table 4 as well as to the UJTL requirements in Annex B.









Table 4. LASER ACTD Assessment COIs and Objectives: Det 1 AFOTEC developed three COIs and 12 objectives for the ACTD.

COI 1: Do LASER technologies effectively support warfighter translation requirements?
Objective 1.1: Assess translation timeliness.
Objective 1.2: Assess translation accuracy.
Objective 1.3: Assess ability to identify critical information.
COI 2: Are LASER technologies suitable in the warfighting environment?
Objective 2.1: Assess setup and teardown.
Objective 2.2: Assess compatibility/interoperability with current warfighting equipment.
Objective 2.3: Assess training requirements.
Objective 2.4: Assess usability/human factors.
Objective 2.5: Characterize failures and maintenance actions required.
Objective 2.6: Assess deployability.
COI 3: What impact do LASER technologies have on the warfighter mission?
Objective 3.1: Assess impact on warfighter productivity.
Objective 3.2: Assess impact on warfighter CONOPS.
Objective 3.3: Assess impact on personnel requirements.

Following each event, the assessment team will compile the data and document how the technologies performed. One type of assessment product will be a Consumer Reports-style chart that describes the observed military utility of each technology for the type of scenarios presented during the LASER ACTD (see Table 5). This chart will provide decision makers with the information needed to acquire, modify, or terminate pursuing each technology. When rating each technology, Det 1 AFOTEC will take technology characteristics, the scenarios involved, and other factors (e.g., languages and domains assessed) into consideration. For example, a technology may show high utility for one language or domain but not another. Many of these factors will be identified in the comments block of the table.

In the presentation that follows, Det 1 AFOTEC's general assessment approach for each objective is described. Sample measures are identified for each objective to indicate the types of measures Det 1 AFOTEC will develop for each assessment event. The exact measures identified in each DED will be tailored to the technologies that will be included in the event and may differ from the sample measures presented here.

Table 5. Sample Military Utility Chart (notional): The results for each technology will be summarized in a similar chart to allow for quick interpretation.

Technology	Warfighter	Rating	Comments
DOMEX TSS	Intelligence		Demonstrated utility for Russian, Spanish, and German; however, it requires software modification to enhance Arabic.
Phraselator	Medical		Considerable improvements required; retest for LASER utility.
TrIM	Command Staff		Used in only one event; warfighters received minimal training; many chose not to use the device.
 Demonstrated utility; minor improvements are recommended.  Demonstrated utility; significant improvements are recommended.  Potential utility; major improvements are required.  No utility was demonstrated.  Insufficient data were collected for a conclusive rating.			

COI 1: Do LASER technologies effectively support warfighter translation requirements?

The first COI is designed to assess the effectiveness of LASER tools. The assessment team established timeliness, accuracy, and ability to identify or relay critical information as essential elements of effectiveness for foreign language translation technologies.

Objective 1.1: Assess translation timeliness.

The assessment team plans to assess whether each technology provides timely translation that meets the warfighters' needs. Det 1 AFOTEC will examine several aspects of translation timeliness, including the time required for system processing of input and the time required to convey meaning or complete the task (e.g., a phrase may be translated quickly but have to be spoken several times before it is translated correctly and understood).

The assessment team will create manual logs to record the necessary time increments required for the technology to assist the warfighter in completing a task or mission. Electronic logs will also be collected, if available, to support manual data collection.

In addition, warfighters will also complete questionnaires to rate the adequacy of translation timeliness for their mission (see Figure 9).

Sample speech-to-speech measures:

- Time to produce translation
- Time to communicate verbal intent
- Time to complete task
- Warfighter opinion

Sample text-to-text measures:

- Time to scan document(s)
- Time required for MT
- Time to complete translation
- Warfighter opinion

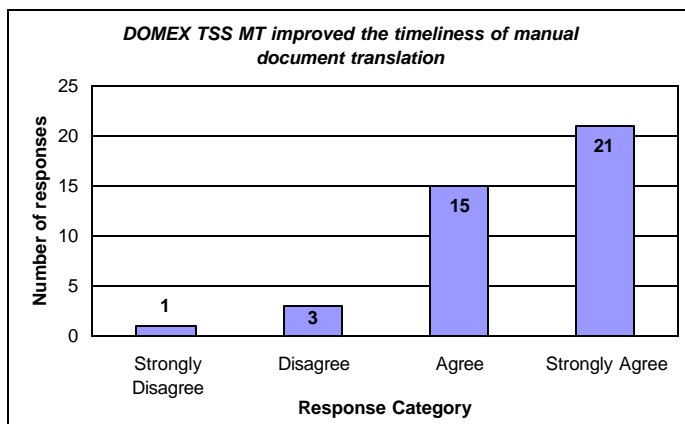


Figure 9. Translation Timeliness (notional): Bar charts will be used to illustrate warfighter ratings of translation timeliness.

Sample measures:

- Rating of word order
- Rating of word choice
- Rating of meaning

AFOTEC will ask warfighters to complete a linguist scorecard for as many messages or documents as possible, without interfering with task completion. Figure 10 depicts a notional data product for the linguists' percentage estimate of translation accuracy for a given speech-to-speech device included in one assessment event.

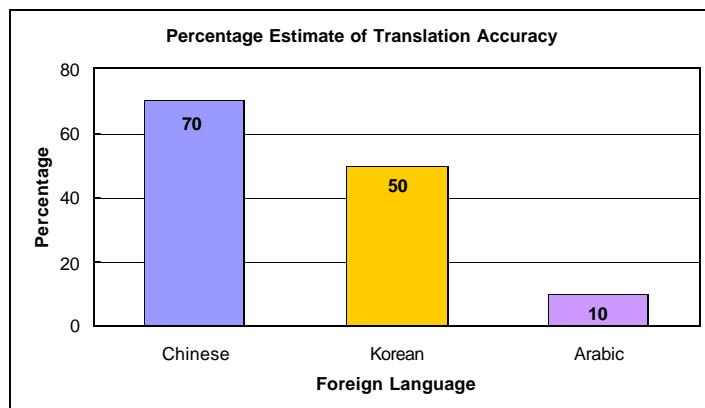


Figure 10. Translation Accuracy (notional): Experienced linguists will be asked to rate translation accuracy via a percentage estimate.

critical information if the warfighter acknowledges the wound and takes the appropriate action. Ground truth knowledge of the messages for speaker and recipient will be essential to Det 1 AFOTEC's assessment of the ability to identify critical information. During each event, data collectors must know the number of critical messages to be conveyed so they can compute the percentage that were correctly identified.

Sample measures:

- Percentage of critical messages or documents identified
- Ability to track documents
- Warfighter opinion of ability to identify critical information

For text-to-text technologies, the assessment team will identify a set number of documents or messages that contain critical information (golden nuggets). Then data collectors will create and use a golden nugget tracking log to record the percentage of critical documents the warfighter was able to identify (see Figure 11). For text messaging technologies, the assessment team will track the critical information contained in electronic message logs. For

Objective 1.2: Assess translation accuracy.

For both speech-to-speech and text-to-text technologies, the assessment team will create and use linguist scorecards to obtain linguist judgments of the quality of translated material. The linguist scorecards will focus on various components of translation accuracy (i.e., word order, word choice, and meaning). Linguists and qualified warfighters will also use linguist scorecards to rate the utility of the translated message for mission requirements and provide a percentage estimate of the accuracy of the translated message. Det 1

Objective 1.3: Assess ability to identify critical information.

The assessment team will create tracking forms, observation logs, and questionnaires to depict the ability of information recipients to identify critical information using LASER tools. Speech-to-speech technologies are typically used to give orders, provide directions, and ask simple questions in a target language. For example, during a medical screening, the critical information to be identified might consist of the message, "My leg is hurt." A tool is successful in providing the ability to identify

platforms that contain databases of foreign documents, the assessment team will capture the warfighters' ability to track and find specific foreign language information through keyword or thematic searches. A document tracking log will be used to record the percentage of documents the warfighter correctly locates as well as the time required to locate the information. In addition to relying on data collector observations, Det 1 AFOTEC will ask warfighters to rate their ability to identify critical information with LASER technologies. The subjective questionnaire will also include items designed to assess warfighters' opinions of ability to identify critical information and track documents.

COI 2: Are LASER technologies suitable in the warfighting environment?

The second COI is designed to assess the suitability of LASER tools for the warfighter. The typical lifecycle of warfighter equipment includes training, deployment, setup, maintenance, and teardown. Within this cycle, the assessment team will also collect system compatibility and human factors data to fully determine the suitability of a technology in its intended environment. Suitability data will also include such objective elements as technology size, weight, power, and transportation requirements.

Objective 2.1: Assess setup and teardown.

The assessment team will collect data on equipment setup and teardown operations during each event. Setup includes all time required to unpack, configure, and prepare equipment for operational use (see Figure 12). Setup time for speech-to-speech technologies includes any time required for speaker-dependent platforms to recognize an individual user. Teardown time begins at the start of teardown and ends at the completion of packaging in appropriate storage containers. In addition to collecting timing information, the assessment team will interview warfighters to capture their opinions of the ease of setup and teardown. Data collectors will also note any problems such as missing parts or specific warfighter difficulties during setup, configuration, verification, and teardown operations.

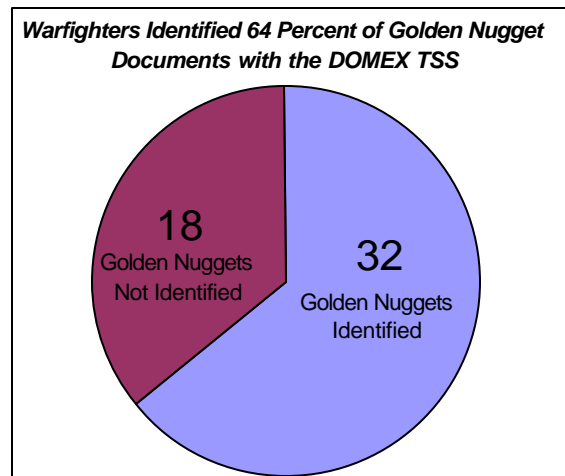


Figure 11. Ability to Identify Critical Information (notional): Det 1 AFOTEC will compute the percentage of golden nugget documents identified.

Sample measures:

- Time to set up and tear down
- Setup and teardown issues
- Warfighter opinion

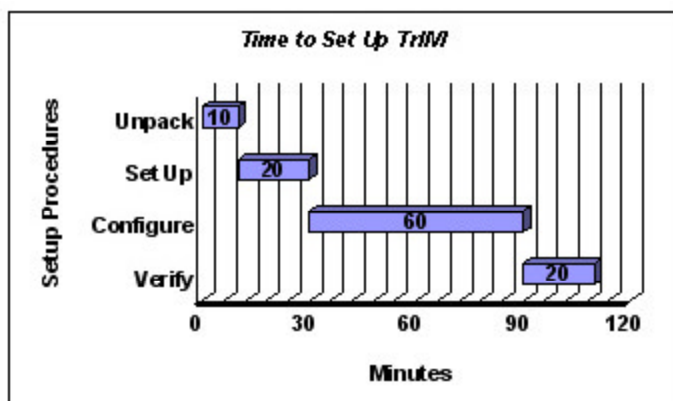


Figure 12. Setup and Teardown (notional): Waterfall charts will be used to illustrate the time required to complete each component of technology setup and teardown.

Objective 2.2: Assess compatibility/interoperability with current warfighting equipment.

Compatibility can be defined as two or more components functioning in the same system or environment without mutual interference. Interoperability is the capability of systems to provide services to or accept services from other devices and to operate effectively together. The assessment team will use observation logs and, if possible, electronic logs to record physical and software conflicts. Physical compatibility includes interconnecting cabling, mechanical linkages, signal interface, electrical compatibility, communication requirements, and hardware integration with any existing warfighter equipment.

Sample measures:

- Compatibility issues
- Communication requirements
- Warfighter opinion

Communication interoperability includes the capability to operate on any existing command, control, communications, computers, and intelligence (C4I) architecture. Data collectors will report software compatibility/interoperability when LASER tools demonstrate the capability to reside with pre-existing software applications and exchange information. Warfighters will complete post-event questionnaires to rate each technology's compatibility/interoperability with current warfighting equipment. Table 6 illustrates a notional data product.

Table 6. Interoperability (notional): The table identifies whether each LASER technology is interoperable with current warfighting equipment.

Technology	Army Battle Command System	Theater Battle Management Core System	Global Command and Control System (GCCS)	GCCS-Maritime
TrIM	Yes	No	Not tested	Not tested
FALCon	No	No	Not tested	Not tested
DOMEX TSS	Not tested	Not tested	Yes	Yes

Objective 2.3: Assess training requirements.**Sample measures:**

- Type of training
- Length of training
- Warfighter opinion

The assessment team will assess the suitability of LASER training by objectively characterizing the type and length of training and any use of training aids (see Table 7). The team will also administer warfighter subjective questionnaires addressing various aspects of training.

Table 7. Training (notional): The length and type of training will be identified by platform.

Technology	Number of Warfighters	Classroom Training	Hands-on Training
Phraselator	20	1 hour	3 hours
Speechalator	18	1 hour	3 hours

Objective 2.4: Assess usability/human factors.

Human factors is an umbrella term for several areas of assessment that include human performance, technology design, and human-computer interaction. The assessment team will focus data collection on human-centered design and system operation. The assessment team will assess usability/human factors by primarily relying on warfighter opinions (see Figure 13).

Several aspects of usability that will be assessed include user friendliness of the interface, usability of hardware features (e.g., controls, switches, and knobs), and the completeness and utility of documentation and help features.

Objective 2.5: Characterize failures and maintenance actions required.

A formal reliability, availability, and maintainability assessment will not be conducted because this type of evaluation is beyond the scope of an ACTD. However, the assessment team will record numbers, types, and causes of failures, collect the nature and length of downtimes, document the actions taken to repair equipment, and characterize support resources. Warfighters will complete questionnaires to provide ratings of technology failures and maintenance actions required. Figure 14 illustrates a notional data product.

Objective 2.6: Assess deployability.

The assessment team will address the balance between the system's support needs and planned logistics support for the system by characterizing the ability to deploy and operate in the intended environment without unacceptable delays. Analysts will examine the power, logistics, and storage requirements as well as any additional infrastructure or special equipment needed to support the technologies. The assessment team will also record the number, size, and weight of any carrying cases required for the technologies. Warfighters will complete questionnaires regarding deployability of the technology to address whether typical users can prepare, transport, and store the technology (see Figure 15).

Sample measures:

- Rating of interface
- Rating of hardware features
- Rating of help features
- Rating of documentation
- Rating of usability

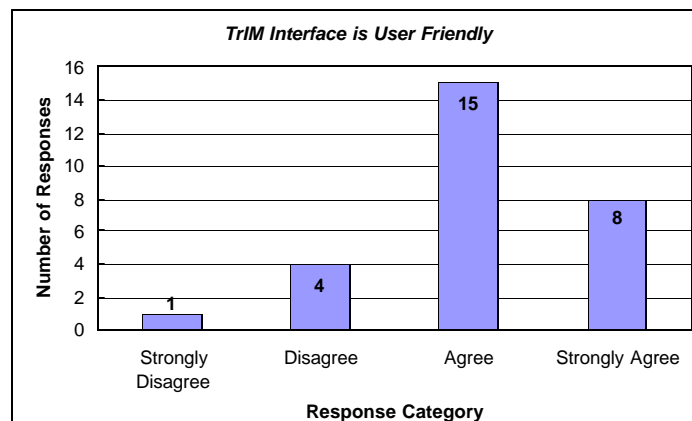


Figure 13. Usability/Human Factors (notional): The usability/human factors assessment will include ease-of-use ratings.

Sample measures:

- Number of failures
- Type of failures
- Time to recover
- Warfighter opinion

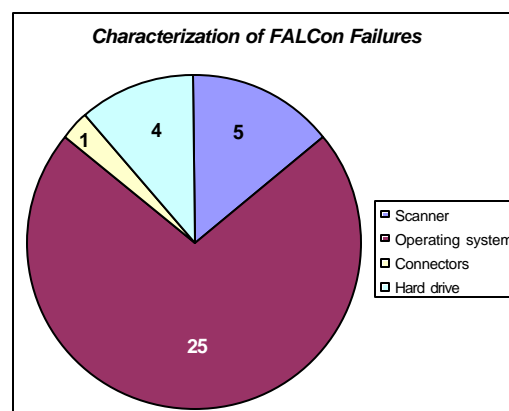


Figure 14. Failures (notional): One method for characterizing failures is to identify the number of failures attributable to each system component.

Sample measures:

- Packing requirements
- Storage requirements
- Power requirements
- Warfighter opinion

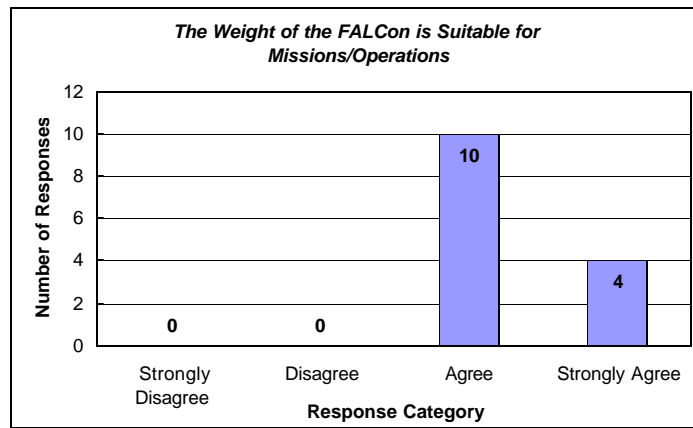


Figure 15. Deployability (notional): Warfighter ratings of size and weight will be used to assess deployability.

COI 3: What impact do LASER technologies have on the warfighter mission?

The third COI is designed to assess the mission impact of LASER tools on the warfighter. The insertion of new technologies and revisions to the existing CONOPS and personnel requirements can improve, degrade, or have no effect on a warfighter's productivity. If personnel or CONOPS changes degrade mission productivity, then its value added to the commander is questionable. The assessment team will collect the impact of LASER technologies on warfighter productivity, CONOPS, and personnel requirements.

Objective 3.1: Assess impact on warfighter productivity.

Hard estimates of the impact of each technology on productivity may not be possible during the LASER ACTD, chiefly because no baseline testing without the tools is planned.

Sample measures:

- Number of completed tasks
- Type of completed tasks
- Time to complete tasks
- Warfighter opinion

For speech-to-speech platforms, the assessment team will use observation logs to characterize the amount of actual information processed, the number of tasks completed, and the time required to complete each task before asking warfighters to comment subjectively on whether this level of processing represents an improvement. Thus, assessment of warfighter productivity will involve describing the processing level observed as well as warfighters' opinion of that level.

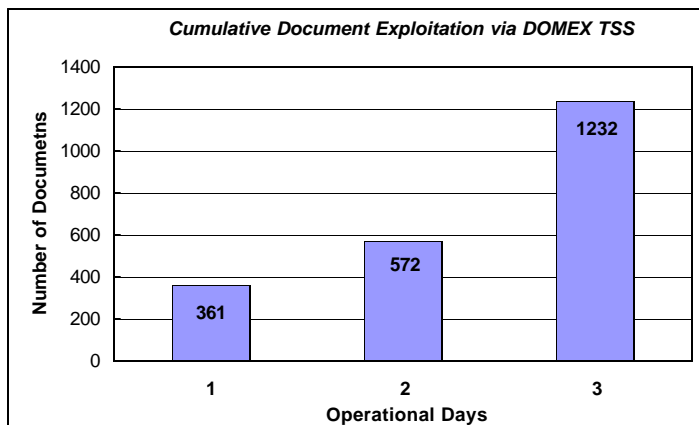


Figure 16. Productivity (notional): Det 1 AFOTEC will identify the number of documents processed to estimate productivity.

For text-to-text tools, data collectors will use observation logs and electronic file captures to detail the number of documents processed by document exploitation platforms (see Figure 16). For text messaging platforms, data collectors will characterize the number and size of messages as well as the time to

For text-to-text tools, data collectors will use observation logs and electronic file captures to detail the number of documents processed by document exploitation platforms (see Figure 16). For text messaging platforms, data collectors will characterize the number and size of messages as well as the time to

complete tasks. In addition, warfighters will be asked to complete questionnaire items to rate the impact of each tool on productivity.

Objective 3.2: Assess impact on warfighter CONOPS.

The assessment team will create and use observation logs to note the task, scenario, and any changes to CONOPS and TTPs. It is essential for Det 1 AFOTEC's assessment that the team members understand the trained CONOPS and TTPs. Warfighters will provide feedback and opinions on perceived CONOPS and TTP issues.

Sample measures:

- Changes to trained CONOPS
- Impact of changes to CONOPS
- Rating of CONOPS

Objective 3.3: Assess impact on personnel requirements.

The purpose of this objective is to identify whether warfighters with minimal or no foreign language skills (as opposed to highly qualified linguists) can use LASER technologies to support operations. To address this objective, the assessment team will create observation logs to collect data on the number and type of personnel required to complete various missions via the technologies. Data collectors will also document the demographic data of all participants and ask them to provide feedback on personnel requirements for each technology. The assessment team will note any additional personnel requirements as they occur throughout the ACTD.

Sample measures:

- Number of personnel
- Type of personnel
- Warfighter opinion

Data Requirements and Data Sources

The data required to address the LASER ACTD COIs and objectives will come from one or more of the following common data collection methods listed below. The data trace in Annex C shows the correlation between data sources and objectives.

Manual Logs

Manual logs will include observation logs, tracking logs, and problem logs. Observation logs are used to capture information while an event is being executed. The information captured includes performance data, user impressions, and the assessors' independent view. Tracking logs are used to identify the status of a document during each phase of the translation process and the time required to complete each phase. Problem logs are used to document failures and maintenance actions. Other manual logs may be needed throughout the ACTD. The actual logs used during a specific assessment event will be contained in the DED, along with special instructions for the data collector.

Linguist Scorecards

Det 1 AFOTEC data collectors will use linguist scorecards to collect translation accuracy information from linguists. The linguists will complete the linguist scorecards to rate word order, word choice, and meaning of translated material. A four-point scale with rating categories of *Poor*, *Fair*, *Good*, and *Excellent* will be used. A fifth choice of *Not Applicable* will also be available.

Electronic Logs

Electronic logs include file copies of products developed during the assessment. Computer logs, input data, and screen capture data provide objective and visual documentation of event activities to support analysis and reporting. Computer logs and screen captures are normally downloaded for transfer to an assessment file storage location at the end of each assessment day.

Warfighter Questionnaires

Questionnaires will be administered to users at the completion of the event for each technology used. The purpose of these questionnaires is to document user feedback from the various operational perspectives with respect to the overall applicability of the demonstrated system and issues related to the system and the evaluation event.

Questionnaires will include four-point rating scales ranging from *Strongly Disagree* to *Strongly Agree* so that warfighters can rate various aspects of technology effectiveness, suitability, and mission impact. Questionnaires will also provide space for comments to allow warfighters to explain their ratings or comment further. A separate page of the questionnaire devoted to warfighter demographic information (e.g., name, rank, and time in unit) will be administered on the first day of each assessment. An analyst will be present during the questionnaire sessions to answer any questions the operators may have and check the forms upon completion.

Warfighter Interviews

The assessment team will conduct formal and informal interviews with the warfighters during and after the assessment events. These interviews may be videotaped or recorded in event logs.

Photo, Video, and Audio Data

The assessment team will photograph, videotape, and audiotape assessment activities, training, debriefings, and interviews, as permitted, to document technology use during each event.

Data Acquisition Plan

The number of data collectors for each of the events will vary depending on the size and scope of the events. The data collectors will gather information on each technology employed, collect available electronic logs, complete manual logs, and administer forms and questionnaires to the warfighters. The data collection teams will be familiar with the exercise/training scripts and unit operations. Experts will be on site if any questions about CONOPS arise during the assessment. It is not expected that Det 1 AFOTEC will be required to provide any instrumentation or a local area network for the LASER ACTD.

Data Management and Analysis Plan

General data management begins with the identification of data requirements; continues with data collection, reduction, and analysis; and concludes with the generation of analysis products. These functions will be distributed among the members of the assessment team.

Database Development

The assessment team will use standard commercial word processing, spreadsheet, and database software (Microsoft Word, Access, and Excel) to store and manage manual logs, linguist scorecards, electronic logs, and questionnaire data collected during the assessments. The Microsoft Access database will include fields for entering data collected during the assessment, such as operator comments from informal interviews, and analyst observations.

Database Verification Plan

All data collection forms will be returned to the data collector at the end of each data collection shift. The data collector will be responsible for completeness, accuracy, and quality of data. The data collector is also responsible for reviewing his or her event logs on a daily basis and annotating the notes where necessary. The data sheets and event logs will be returned to the lead analyst at the end of each day. The lead analyst will verify the completeness and accuracy of the data prior to data entry and review the completed database to ensure data accuracy.

Database Processing

Data entry will be conducted in the field when feasible for all ACTD events. Data collectors will be trained in data entry procedures and all data will be entered on laptop computers. The data collectors will check the data for completeness as the data are entered. After a set of data is entered, the lead analyst will check the database against the hard copy of the data collection forms to ensure the quality of the data entry process.

Training Plan

Det 1 AFOTEC will train data collectors in data collection and data entry prior to each deployment. Training will include a review of the planned schedule for assessment events, a review of the scenario, a detailed description of each form and questionnaire, and a description of other required data sources (e.g., photographs). Training will also include the “who, what, when, and where” for administering questionnaires and forms. The data collection team will conduct a dry run in which the data collectors will have the opportunity to record sample data on their forms. The lead analyst will check the forms to determine if further training is needed or if the forms require modification.

Prior to each assessment event, data collectors will conduct brief training sessions to familiarize the warfighters with the data collection forms and questionnaires and the information and level of detail that will be required.

Reporting

Before returning to home base at the conclusion of each assessment event, Det 1 AFOTEC will conduct an outbrief for the OMs to summarize general impressions. The brief will contain the initial impressions from its associated event. The draft final report will be published 60 working days after completion of each event and will include the assessment team’s final findings regarding military utility of each technology and recommendations for improvement. The final version of each report will be published two weeks after receipt of comments from both OMs.

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Field Execution and Planning

The implementation of this IAP entails numerous activities that can be grouped into three phases. The first phase encompasses pre-deployment activities—those planning and coordination activities necessary for data management, analysis, and assessment support. The second phase is the on-site execution of data collection and analysis activities. The third phase is the post-deployment phase, which involves the data reduction, analysis, and report writing.

Pre-Deployment Activities

This phase includes all the planning and coordination efforts necessary to ensure a successful effort.

Plan Analysis Effort

Develop and Print Questionnaires and Forms

Det 1 AFOTEC will develop exercise-specific questions to allow warfighters to express their opinions on the technologies and CONOPS used during each exercise.

Complete DED

A DED will be completed prior to each ACTD event in which Det 1 AFOTEC will participate in data collection purposes for the MUA. The DED will cover the specific methodology, subobjectives and measures, data requirements, data collector responsibilities, forms, and questionnaires required to complete the assessment.

Coordinate Assessment Effort

Conduct Site Survey

Prior to the assessment, Det 1 AFOTEC personnel will conduct site surveys of any potential assessment sites to determine communications requirements, coordinate frequency assignments, and plan for on-site equipment needs.

Coordinate Logistic Requirements

Logistics requirements will be researched and coordinated prior to each deployment. A Det 1 AFOTEC point of contact (POC) will be identified to handle emerging requirements from the field.

Coordinate Transportation and Lodging

Transportation and lodging will be arranged via commercial carriers and commercial facilities for all personnel required for the data collection and analysis effort unless deploying to “real-world” operational environments. In the latter case, government transportation and lodging may be used.

Coordinate Safety Plan

The Det 1 AFOTEC safety officer will prepare guidelines detailing the potential safety hazards at the assessment sites and hazard avoidance procedures for assessment team personnel.

Conduct Equipment Operational Checkout

The Det 1 AFOTEC assessment team will set up and operate all equipment prior to deployment to the assessment site. The equipment operational checkout ensures that the equipment designated for the field will operate in its intended configuration.

Coordinate Assessment Support

Identify Personnel

The assessment team will determine the number of data collectors, analysts, and subject matter experts required for each event. The team will coordinate to ensure that there are enough data collectors for each assessment.

Train Data Collectors

Additional training, such as site familiarization, will be conducted on-site prior to assessment events.

Pack and Ship Equipment

Det 1 AFOTEC will be responsible for packing and shipping all data collection equipment required to support the Det 1 AFOTEC data collection effort. The OMs are responsible for ensuring developers transport their individual technologies to the venues for assessment.

On-Site Execution

Setup

Establish Analysis Workstations

The assessment team will establish a “base of operations” for the assessment effort in the provided facilities. The base of operations will function as a central location for all data collection, entry, and analysis functions.

Set Up and Check Out Equipment

The core members of the assessment team will arrive on site a few days prior to the start of the exercise to set up and check out all data collection equipment. All equipment, supplies, and documentation will be inventoried and checked to ensure all of the necessary items have arrived.

Attend Training Sessions and Modify Questionnaires

Members of the assessment team will attend any training sessions for the technologies included in the assessment. If necessary, modifications to the questionnaires will be made if new information becomes available as a result of the training sessions.

Establish Daily Schedule

The lead analyst will establish a daily schedule of data collection activities and choose the individual responsible for covering the events. This schedule will be built around event scenarios to maximize data collection capabilities during key events.

Assessment Execution

Conduct Pre-Brief/Post-Brief

Prior to and immediately following each data collection shift or each data collection day, the assessment team will conduct short sessions to discuss the relevant events, any problems, and any changes to the data collection schedule or scenario. These sessions will include a brief review of the data collected up to that point.

Conduct On-Site Interviews

During the assessments, analysts and data collectors will conduct interviews with the warfighters, command elements, and decision makers to determine the value added by the equipment and to elicit recommendations or comments. These interviews may be informal or scheduled.

Conduct Data Quality Control

All members of the assessment team will participate in some form of quality control. The data collectors in the field will ensure that their data collection forms are complete and annotated to explain important events. Analysts and data processors will compile, review, and check the quality of all collected media and data as they come in.

Conduct Data Entry

The data collection forms will be collected at the end of each shift or event and at the end of each day of the assessment. Data processors will enter all data collected during the assessment into laptop computers. The data manager will check all hard copy forms against the data entered into the database.

Administer Questionnaires

Questionnaires will be administered to all warfighters at the end of the assessment. These questionnaires may be completed online or manually.

Site Recovery

Back Up Data Collection Media

At the end of each assessment, the lead analyst will create backup copies of all electronic media. Paper forms will be copied, and the lead analyst will maintain one copy.

Inventory, Pack, and Ship Equipment

At the end of each assessment, the assessment team members will turn in all equipment. The core team members will inventory the equipment to ensure that everything has been returned before packing and shipping any necessary equipment to the home base to return to the inventory.

Inventory and Ship Data

The lead analyst will ensure that all data forms and media have been collected and inventoried. The original and backup data will then be packed separately and shipped to the home base.

Post-Deployment Activities

The data and related products will be analyzed for trends, important events, operational issues, and warfighter comment themes. The main focus of the effort will be an overall determination of the military utility of each of the candidate technologies and identification of opportunities for improvement to the CONOPS. When the data have been collected from multiple assessment events, the data sets will be compared to determine the correlation among them.

The assessment team will begin to generate the charts, graphs, and tables in the field, but the majority of this effort will be completed at home base after each assessment. The analysts will develop histograms, charts, and tables to display the data collected during each LMUA and MUA and produce a final report of the results.

Logistics

Logistics support for the ACTD events will vary between the assessments. For the smaller events, logistics support will be less involved because fewer data collectors are required. For major exercises, logistics support may be more involved, including communications, facilities, transportation, equipment support, and security. For each ACTD event, Det 1 AFOTEC will develop a specific logistics plan and include it in the DED.

Communications

Det 1 AFOTEC will coordinate communications support for its assessment team. Cellular phones may be provided to the assessment team as required for field communications and personal safety; otherwise, local phone services will be used.

Facilities

The assessment sites will provide all of the required support facilities needed for the assessments.

Equipment

Det 1 AFOTEC will provide all of the required data collection equipment for its assessment team. All data collectors will be trained by their respective agencies on any unit-specific equipment they will be required to operate during the assessments.

Transportation

In general, transportation to and from the assessment sites will occur via commercial airline and rental car. If an assessment occurs in the context of real-world operations, the assessment team may rely on military transportation instead. The assessment team will use commercial lodging at the assessment sites unless government lodging is available or required.

Security

A security review will be conducted to address all security issues associated with the conduct of LASER assessments, collection and handling of data, and classification of those data. Physical security will be determined based on the location and event-specific issues. See Annex D for further details.

Safety

Each DED will contain a site-specific safety plan; all Det 1 AFOTEC personnel will be required to adhere to this plan along with site-specific safety concerns. Safety briefings will be conducted prior to each assessment to ensure all personnel are aware of any safety issues and have read the safety plans.

Environmental

Each DED will identify any specific environmental concerns at each of the assessment sites. Assessment team personnel will comply with all environmental requirements associated with each of the assessment sites. Coordination and permissions of specific environmental concerns will be addressed by the responsible agency for each assessment location.

Command of the Assessment Team

The assessment team for the LASER ACTD will include the Det 1 AFOTEC test director (TD), a lead analyst, and one or more data collectors.

Test Director

The Det 1 AFOTEC TD is responsible for overseeing the data collection effort to support each assessment. The TD is also the interface for assessment support issues with site representatives and other agencies participating in the event. The TD is responsible for day-to-day interface for assessment support issues with the host organization. He will ensure that all team members and support personnel read and adhere to the Det 1 AFOTEC Health and Safety Plan for each assessment and will brief all team members and support personnel on operational and physical security issues related to the event. The TD is ultimately responsible for all aspects of test conduct and data collection.

Lead Analyst

The Det 1 AFOTEC lead analyst will serve functionally as the assistant TD in his or her absence. The lead analyst will also serve as a data collector during each event, performing the same activities identified below for data collectors.

Data Collectors

Data collectors will be responsible for observing demonstration activities, completing daily observation logs, and entering collected data. Data collectors will also see that warfighters complete appropriate forms and questionnaires at the correct point in the assessment. Data collectors will provide brief instructions to the warfighters as to how the forms should be completed and encourage the users to enter comments to explain the ratings given. Data collectors will check over the forms and questionnaires to ensure that all pertinent questions have been answered. They will assist the lead analyst in entry and verification of collected data. During each event, data collectors will photograph and videotape or audiotape activities to document events.

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Annex A—Acronyms

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ACTD	Advanced Concept Technology Demonstration
AFOTEC	Air Force Operational Test and Evaluation Center
BCBL	Battle Command Battle Laboratory
BCBL(H)	BCBL, Fort Huachuca
C2	command and control
C4I	command, control, communications, computers, and intelligence
CAST	Compact Aids for Speech Translation
COI	critical operational issue
CONOPS	concept of operations
DCI	Director of Central Intelligence
DED	demonstration execution document
Det 1	Detachment 1
DoD	Department of Defense
DOMEX	Document and Multimedia Exploitation
FALCon	Forward Area Language Converter
FLC	Foreign Language Committee
FY	fiscal year
GCCS	Global Command and Control System
HICIST	Human Intelligence and Counterintelligence Support Tools
IAP	integrated assessment plan
IPT	integrated product team
LASER	Language and Speech Exploitation Resources
LMUA	limited military utility assessment
LUE	limited user evaluation
MARFORPAC	Marine Forces Pacific
MEC	Marine Experimentation Center
MT	machine translation
MUA	military utility assessment
OCR	optical character recognition
OM	operational manager
OP	Operational
PDA	Personal Digital Assistant
POC	point of contact
SMINDS	Speaking Multilingual Interactive Natural Dialogue System
SN	Strategic National
ST	Strategic Theater
TD	test director
TM	technical manager
TrIM	Translingual Instant Messenger
TSS	Tactical Support Suite
TTP	tactics, techniques, and procedures
UJTL	Universal Joint Task List
USAINSCOM	United States Army Intelligence and Security Command
USJFCOM	United States Joint Forces Command
USPACOM	United States Pacific Command
VRT	Virtual Response Translator

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Annex B—Preliminary Universal Joint Task List

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The UTJL requirement tasks identified in Table B-1 represent a wide variety of tasks that can be further differentiated by Service. Each task could therefore apply to all of the COIs that Det 1 AFOTEC developed for the LASER ACTD. The assessment team will be able to link the tasks to specific COIs and objectives once scenarios are developed for each event.

Table B-1. Preliminary Capability and UJTL List: The list of capabilities for each UJTL will be updated throughout the ACTD.

LASER Capability	UJTL Requirement
<p>Text-to-text capability for multinational and coalition coordination activities</p> <p>Speech-to-speech capability for multinational and coalition coordination activities</p>	<ul style="list-style-type: none"> • Strategic National (SN) Tasks <ul style="list-style-type: none"> ○ Conduct strategic deployment and redeployment. SN-1 ○ Develop national strategic intelligence, surveillance and reconnaissance. SN-2 ○ Coordinate forward presence of forces in theaters. SN-3 ○ Provide sustainment. SN-4 ○ Provide strategic direction and integration. SN-5 ○ Foster multinational and interagency relations. SN-8 ○ Manage strategic deterrence of chemical, biological, radioactive, nuclear, and enhance conventional weapons. SN-9 • Strategic Theater (ST) Tasks <ul style="list-style-type: none"> ○ Deploy, concentrate, and maneuver theater forces. ST-1 ○ Conduct theater-strategic intelligence, surveillance, and reconnaissance. ST-2 ○ Employ theater strategic firepower. ST-3 ○ Sustain theater forces. ST-4 ○ Provide theater strategic C4I. ST-5 ○ Coordinate theater force protection. ST-6 ○ Establish theater force requirements and readiness. ST-7 ○ Develop and maintain alliance and regional relations. ST-8 • Operational (OP) Tasks <ul style="list-style-type: none"> ○ Conduct operational movement and maneuver. OP-1 ○ Employ operational firepower. OP-3 ○ Provide operational logistics and support. OP-4 ○ Provide operational command and control (C2). OP-5 ○ Provide operational force protection. OP-6

Continued

Table B-1. Preliminary Capability and UJTL List (Concluded): The list of capabilities for each UJTL will be updated throughout the ACTD.

LASER Capability	UJTL Requirement
<p>Text-to-text capability for military operations</p> <p>Speech-to-speech capability for military operations</p>	<ul style="list-style-type: none"> • SN Tasks <ul style="list-style-type: none"> ○ Conduct strategic deployment and redeployment. SN-1 ○ Develop national strategic intelligence, surveillance, and reconnaissance. SN-2 ○ Coordinate forward presence of forces in theaters. SN-3 ○ Provide sustainment. SN-4 ○ Provide strategic direction and integration. SN-5 ○ Foster multinational and interagency relations. SN-8 ○ Manage strategic deterrence of conventional weapons. SN-9 • ST Tasks <ul style="list-style-type: none"> ○ Deploy, concentrate, and maneuver theater forces. ST-1 ○ Conduct theater-strategic intelligence, surveillance, and reconnaissance. ST-2 ○ Employ theater-strategic firepower. ST-3 ○ Sustain theater forces. ST-4 ○ Provide theater-strategic C4I. ST-5 ○ Coordinate theater force protection. ST-6 ○ Establish theater force requirements and readiness. ST-7 ○ Develop and maintain alliance and regional relations. ST-8 • OP Tasks <ul style="list-style-type: none"> ○ Conduct operational movement and maneuver. OP-1 ○ Conduct operational intelligence, reconnaissance, and surveillance. OP-2 ○ Employ operational firepower. OP-3 ○ Provide operational logistics and support. OP-4 ○ Provide operational C2. OP-5 ○ Provide operational force protection. OP-6
<p>Text-to-text capability for humanitarian/civil affairs operations</p> <p>Speech-to-speech capability for humanitarian/civil affairs operations</p>	<ul style="list-style-type: none"> • SN Tasks <ul style="list-style-type: none"> ○ Conduct strategic deployment and redeployment. SN-1 ○ Foster multinational and interagency relations. SN-8 • ST Tasks <ul style="list-style-type: none"> ○ Sustain theater forces. ST-4 ○ Provide theater-strategic C4I. ST-5 ○ Coordinate theater force protection. ST-6 ○ Develop and maintain alliance and regional relations. ST-8 • OP Tasks <ul style="list-style-type: none"> ○ Conduct operational movement and maneuver. OP-1 ○ Employ operational firepower. OP-3 ○ Provide operational logistics and support. OP-4 ○ Provide operational C2. OP-5 ○ Provide operational force protection. OP-6

Annex C—Data Trace

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Table C-1. Data Trace: The table shows which data sources will be used to address each of the COIs and objectives.

COIs and Objectives	Data Source				
	Manual Logs	Linguist Scorecard	Electronic Log	Warfighter Questionnaires	Warfighter Interviews
COI 1: Do LASER technologies effectively support warfighter translation requirements?					
Objective 1.1: Assess translation timeliness.	X		X	X	X
Objective 1.2: Assess translation accuracy.		X		X	X
Objective 1.3: Assess ability to identify critical information.	X			X	X
COI 2: Are LASER technologies suitable in the warfighting environment?					
Objective 2.1: Assess setup and teardown.	X			X	X
Objective 2.2: Assess compatibility/interoperability with current warfighting equipment.	X		X	X	X
Objective 2.3: Assess training requirements.	X			X	X
Objective 2.4: Assess usability/human factors.	X			X	X
Objective 2.5: Characterize failures and maintenance actions required.	X		X	X	X
Objective 2.6: Assess deployability.	X			X	X
COI 3: What impact do LASER technologies have on the warfighter mission?					
Objective 3.1: Assess impact on warfighter productivity.	X		X	X	X
Objective 3.2: Assess impact on warfighter CONOPS.	X		X	X	X
Objective 3.3: Assess impact on personnel requirements.	X			X	X

Note: Photo/video/audio data sources are not included since they may apply to every objective.

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Annex D—Program Protection

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Overview

This program protection plan outlines the methods that Det 1 AFOTEC will use to protect information generated during the LASER ACTD. The principal protection concern is the real-world data translated/transcribed by the various LASER technologies. There is the possibility that, during real-world operations, some classified documents are transcribed or classified interviews are translated. The Det 1 AFOTEC assessment approach does not require the storage of specific classified documents or conversations. Therefore, assessment team members will record their own observations, the externals of the documents and conversations (e.g., document file size and accuracy of translation), and warfighters' opinions, all of which are unclassified. In addition, the team will capture only site-approved photographs of LASER activities and will ensure that no classified computer displays are visible in the photographs. Det 1 AFOTEC will include a rigorous program protection plan in each DED, highlighting the specific security precautions for the event.

Responsibilities

The offices of primary responsibility for all LASER ACTD security are the OMs from MARFORPAC and USAINSCOM. Within MARFORPAC, the POC for program security matters is Mr. Chris Breault at breaultc@battelle.org and the POC at USAINSCOM is Mr. Dave Croy at dlcroy@vulcan.belvoir.army.mil. For the Det 1 AFOTEC data collectors during the LASER ACTD, the security POC is the TD, Technical Sergeant Chris Brooks, at christopher.brooks@afotec.af.mil. These individuals will ensure that any security matters are relayed to the appropriate security personnel within their respective organizations.

Automated Data Processing

During the LASER ACTD, Det 1 AFOTEC data collectors will store, process, and quality control all data using unclassified laptops. After the data have been analyzed and incorporated into the unclassified Microsoft Access database, the Det 1 AFOTEC lead analyst will limit access to the database on a need-to-know basis.

Operations Security

Proposed public disclosure of unclassified information regarding the LASER ACTD is to be addressed through appropriate channels to MARFORPAC and USAINSCOM for approval. All personnel associated with the LASER ACTD must protect all information as "For Official Use Only" unless otherwise directed.

Compromise Procedures

In the event of a compromise, the person identifying the compromise should immediately notify the LASER ACTD OMs and the Det 1 AFOTEC TD.

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